Under rules promulgated by the FCC, only two firms in each of the 734 geographic markets are licensed to provide facilities based cellular service. Using the favored measure of market concentration, the Herfindahl-Hirschman Index (HHI), the cellular service market is enormously concentrated. Its HHI level is at a minimum 5,000. To put that figure in perspective, the Department of Justice has concluded that mergers which result in the existence of a market with a HHI level in excess of 1,800 raise "competitive concerns. . . . (that are) quite serious." The HHI level for the relevant cellular market is more than double that threshold.

ii. Lack Of Entry: The ease with which the potential competitors can enter a given market can serve as a powerful check on the ability of participating firms to profitably sustain prices above cost, even in highly concentrated markets such as cellular. In markets with few obstacles to entry, participating firms would not find it profitable to raise prices substantially above cost since new competitors could quickly enter the market, sell the same product at a lower price, and take customers away from the existing firms.

In cellular, however, the reverse is true. Federal regulation places an absolute barrier on the ability of new facilities-based carriers to enter the market. Hence, the market power implications of cellular's enormously concentrated markets are heightened by the fact that there is no realistic competitive threat from potential new market entrants.

It should be noted that the Commission is attempting to

mitigate this problem by introducing two new technologies into the

product demand is consistently strong and is expected to remain strong in the long term provides ample opportunity for the participating firms, acting interdependently, to set supracompetitive prices. [21/]

c. Ownership Patterns Facilitate Interdependent Pricing: It is common practice for licensees to compete in one or more markets yet be partners in other markets. The Commission has recognized the need to carefully monitor this increasingly common practice. For example, in San Francisco, McCaw Cellular and PacTel Cellular are partners in competition with GTE MobileNet and Contel Cellular. In Los Angeles, CTE, Contel and PacTel are partners in competition with McCaw and BellSouth Mobility. In Miami, BellSouth competes against McCaw. And in Atlanta, BellSouth competes against PacTel. While this example may be confusing, it illustrates how, in the cellular industry, the lines between partners and competitors are becoming increasingly blurred. The General Accounting Office believes this pattern of ownership facilitates interdependent pricing.

In conjunction with the industry's structural characteristics, the above conditions demonstrate that cellular licensees possess market power.

iv. Economic Versus Monopoly Rents. The fact that there is a wide divergence between cellular service prices and underlying costs is well-documented. The Commission's Office of Plans and Policy, in a study of spectrum allocation issues

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21/ DLJ at 7-15.

released in November, 1992, estimated that the cost-price margin for a cellular licensee in the Los Angeles market would average 50 percent over the period 1992-2000. In a study commissioned by NCRA for hearings held on July 1, 1992 by the Senate Communications Subcommittee, Pitsch Communications estimated that the cellular industry's rate of return on capital would average over 30% during a similar period.

Perhaps the clearest evidence of high cost-price margins can be found in the prices paid by investors for cellular systems in comparison to the system's replacement costs. A recent study by the National Telecommunications and Information Administration found that the average sale price of 24 cellular properties averaged $131 "per pop" for small systems, $169 per pop for medium size systems, and $251 per pop for large systems. These prices are borne out by the most recent sale of Metro Mobile's cellular holdings to Bell Atlantic at a purported $202 per pop.

The replacement costs of all tangible assets of a typical cellular system is approximately $18 per pop. Hence, the trading prices of cellular systems, which are well in excess of replacement costs, clearly demonstrate that investors, including current licensees, anticipate significant margin between revenues and underlying costs now and in the future.

The Commission has made it clear, however, that the "supracompetitive-price approach to defining market power must be applied precisely so that economic rents are distinguished from monopoly profits." In light of this requirement, NCRA asked Pitsch Communications to update the cash flow analysis which it

performed for last year's Senate hearings and, in so doing, to address the issue of scarcity rents (See Appendix B at 11-13).

First, Pitsch adjusted its results to consider the scarcity value of cellular spectrum. The adjustment did not significantly change the results of the cash flow analysis. Using NTIA's estimates of spectrum values, Pitsch estimated the scarcity value of 50 Mhz of cellular spectrum to be approximately $1.438 billion. Including a 15 percent return on that amount to reflect the scarcity value of spectrum in the updated cash flow analysis reduces the overall return on capital in excess of 15 percent from $8 billion to $7 billion (Appendix B at 11).

Second, Pitsch also considered the significance of technological constraints as a source of scarcity rents. Its report questions whether capacity limitations in most cases provide a substantial explanation of cellular's current high

There is also the pending changeover to digital capability, which should provide a huge increase in capacity. It is significant that the pending availability of digital technology and the attendant growth in capacity appears to have had little impact on the market value of cellular properties. On the other hand, just the slightest hint of additional competition has had well-documented effects on market values. 23/

It appears evident that the large cost-price margins reflected in studies by the Commission's Office of Plans and Policy and Pitsch Communications, and the high trading values of cellular properties, cannot be explained away by either spectrum scarcity or other sources of scarcity.

v. Recent Determinations By Federal Governmental Bodies Support The Position That Cellular Carriers Have Market Power. The conclusion that cellular carriers possess market power was buttressed just five months ago in a study conducted by the Commission's Office of Plans and Policy, which determined that cellular rates would fall approximately 25% if just one additional facilities based carrier were permitted to enter the market. See Changing Channels: Voluntary Reallocation of UHF Television Spectrum, OPP Working Paper 27, November 1992. OPP's analysis makes clear that cellular consumers would save nearly two billion dollars over the next decade in Los Angeles alone. See Appendix B at 1, n.1. OPP's analysis demonstrates that licensees' rates are

23/ See, for example, Smith Barney, "Cellular Industry Quarterly Update," September 6, 1989, at 2.

far above competitive market levels, which is strong evidence that licensees' have substantial market power.

These Commission and OPP determinations are further buttressed by similar findings in the last two years by the U.S. Department of Justice [24/], the NTIA [25/], the GAO [26/] and the staff of the Federal Trade Commission [27/]. In each instance, these components of the federal government concluded that there is no evidence supporting a finding that the cellular market is competitive, and there is abundant evidence that licensees have substantial market power.

B. Requiring Licensees To File Tariffs As Dominant Carriers Will Further The Public Interest

The forgoing demonstration that licensees are dominant carriers eviscerates CTIA's claim that such licensees should be permitted to tariff their interstate services under "streamlined" rules designed for carriers without market power. The Commission has determined unequivocally that detailed tariff filings by

dominant carriers are necessary to ensure that their rates and services comport with the requirements of Title II of the Act. [cite Competitive Carrier]. That policy should now be applied to licensees, for the reasons discussed below.

First, licensees formerly were excused from tariffing requirements because the Commission thought it had the authority to waive such requirements. AT&T v. FCC makes it plain that the Commission does not possess such authority.

Second, licensees formerly were excused from tariffing merely because the Commission thought it might be burdensome to initiate tariffing filing requirements where they never had existed before. This rationale is no longer valid because, in the wake of AT&T v. FCC, licensees -- like all other common carriers that provide interstate services -- must now prepare and file interstate tariffs.

Third, under well established Commission precedent, the Commission can not excuse cellular licensees from filing tariffs in accordance with their "dominant" status while continuing to apply such tariffing requirements to all other dominant carriers (e.g. AT&T and the LECs). Unlike cellular carriers, AT&T faces the prospect of facilities-based competitive entry. This same analysis applies to the LECs, especially with regard to special access services. Thus, excusing licensees from tariffing obligations reflecting their status as dominant carriers may, have grave legal ramifications in many Commission proceedings.

Fourth, circumstances have changed significantly since the Commission determined that it would be burdensome for licensees to

file tariffs. We now know that the mobile services marketplace bears no resemblance to that market as it existed in 1982. Then, mobile services were indeed provided predominantly by small mom and pop companies, many if not most of which provided predominantly "local only" type services. The world has moved substantially beyond that phase. As noted, cellular carriers are now by large, sophisticated concerns, with nationwide and regional, as well as local services.

When that finding was made ten years ago, the Commission was unsure how the cellular market would develop. We now know that demand for cellular services is exploding, and that cellular service is increasingly not a discretionary item. Instead, as the Commission has recognized, it is a powerful tool that can spur economic growth within a community, improve the quality of life, and promote and preserve public safety. This is demonstrated by the fact that cellular penetration rates are growing exponentially.

Therefore, unlike the case in 1982, there now is a strong public interest rationale for requiring licensees to tariff their interstate rates as dominant carriers. As the OPP report demonstrates, consumers today are paying cellular rates that greatly exceed competitive market levels. WRRA also believes there is rampant unreasonable discrimination between subscribers and roamers with respect to interstate calls, which will become apparent with the filing of service specific tariffs. For example, airtime for the origination of an interstate roaming call is often $.99 per minute (regardless of time of day) as compared

to less than half that for charges to a subscriber of the originating system. It is NCRA's understanding that the incremental additional costs of handling the roaming call is far less than $.50, and so the 100 plus % difference in the price of the service bears little or no relation to its costs of provisioning. NCRA believes that when the scope of this discrimination becomes apparent, it will put downward pressure on the rates for interstate roaming services, and thereby provide a real benefit to existing and potential cellular users.

Fifth, the Commission need not expend any resources on a on-going basis in order to accomplish this result. As occurs in the landline market, requiring licensees to file dominant carrier tariffs will give private parties the means to scrutinize cellular offerings and report any questionable practices to the Commission. The Commission, in turn, will remain free to act on such reports as it sees fit, [28/] thereby retaining complete control over the amount of resources it expends to review licensee's rates. If dominant carrier tariffing requirements are not imposed in the first instance, however, neither the Commission nor private parties will have the information necessary to evaluate whether licensees' are violating the Act. This result is contrary to the public interest.

28/ Nor need the Commission worry that it will be inundated with spurious protests to the cellular tariffs. The Commission has become extraordinarily efficient in dismissing tariff protests, most times limiting its orders to one or only a very few pages. Under these circumstances, protestants would have to weight the costs of protest preparation with the highly likely probability that spurious protests would be dismissed out of hand.

C. Requiring Licensees To File Tariffs As Dominant Carriers Can Be Accomplished Within The Context Of Existing FCC Rules

CTIA makes the unsubstantiated claim that requiring licensees to comply with dominant carrier tariffing requirements will impose costly and time-consuming burdens on them with no corresponding benefits. This claim simply is not correct. As shown above, the potential benefits of imposing such requirements are significant and well worth obtaining. Moreover, especially when measured against these benefits, the alleged burdens claimed by CTIA are illusory.

CTIA cannot reasonably claim that requiring licensees to tariff all of their rates (as opposed to minimum/maximum rates) will impose a significant burden on licensees. Licensees will have to gather the necessary information even if they were subject to nondominant filing requirements. The additional "burden" of filing the information is infinitesimal. Thus, such a requirement should be adopted.

Moreover, to the extent there is any basis to claim that dominant tariffing filing requirements will burden some licensees, the Commission can adjust such requirements, as appropriate. This is current Commission practice with regard to LECs, for example. Even the smallest LEC is considered a "dominant" carrier, but all LECs do not bear the same tariff cost support requirements. Rather, the Commission has attempted to minimize filing burdens in some respects for small, mostly rural LECs. See, e.g., Regulation of Small Telephone Companies, 2 FCC Rcd 3811 (1987).

In summary, NCRA urges the Commission to require licensees to file dominant carrier tariffs for their interstate services. At a minimum, the Commission should require licensees to tariff all of their services and rates (not just minimum/maximum rates), and provide information the Commission deems sufficient to support its tariffs. In order to enable the Commission and interested parties a reasonable opportunity to review such filings, they should be made in accordance with the standard notice period of 45 days.

CONCLUSION

NCRA supports CTIA's request that the Commission clarify the tariffing obligations of cellular licensees, as discussed herein.

RESPECTFULLY SUBMITTED

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March 19, 1993

APPENDIX A

Estimated Cellular Carrier Revenue

	CARRIER	SUBSCRIBERS *	ANNUAL REVENUE **
1.	McCaw	2,046,000	$1,682,057,520
2.	BellSouth	1,000,000	$822,120,000
3.	S.W. Bell	960,000	$789,235,200
4.	GTE	575,000	$472,719,000
5.	Ameritech	550,000	$452,166,000
6.	PacTel	550,000	$452,166,000
7.	Bell Atl	315,000	$258,967,800
8.	NYNEX	307,500	$252,801,900
9.	US West	293,000	$240,881,160
10.	Cellular Comm	285,000	$234,304,200
11.	Centel	280,000	$230,193,600
12.	Centel	236,000	$194,020,320
13.	US Cellular	115,000	$94,543,800
14.	AllTel	82,677	$67,970,415
15.	Vanguard	69,200	$56,890,704
16.	Century Cellunet	54,542	$44,840,069

* Cellular Business Magazine, May, 1992, page 32

** Annual revenue figures represent subscriber base multiplied by $822.12, which is $68.51, the average monthly revenue figure reported by CTIA in its September 8, 1992 industry survey, multiplied by 12.

APPENDIX B

Estimation of Cellular Industry Cash Flows, Market Valuations, and Profit Levels

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Introduction and Summary

This report provides market valuations and estimates of expected returns on capital for the cellular industry. The estimated profit levels are supracompetitive and imply prices substantially above cost. Specifically, over a ten year period the average annual rate of return on capital in the cellular industry is estimated to exceed 30 percent. Over the same period the discounted profits of the cellular industry nationwide will exceed a 15 percent rate of return on capital by at least $8 billion. That number falls to roughly $7 billion dollars after including an estimate of the scarcity value of the spectrum.

This discounted cash flow analysis is based on conservative estimates of revenues and generous estimates of costs. They are consistent with or conservative in comparison to the estimates and analysis made by investment analysts and the FCC's own staff report written by Evan Kwerel and John Williams of the Commission's Office of Plans and Policy. Indeed, Kwerel and Williams estimate that the presence of a third carrier would lower cellular prices 25 percent and their analysis estimates that the direct savings over the next eight years to Los Angeles cellular consumers from such a price reduction would exceed $2 billion.[1]

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[1] Table 8 states that the present value of the consumer surplus (rectangle) from a 1 percent price cut in the Los Angeles

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The conservative nature of this report's discounted cash flow analysis can be illustrated by the low implied per pop valuation of roughly $90. Moreover, while cellular industry spokesmen argue that the industry's costs in some cases are higher, they fail to produce real numbers. Nor can the purported cost ranges they posit be harmonized with the value that the market places on cellular companies.[2] Indeed, leading cellular carriers routinely have paid prices in excess of $200 per pop for cellular properties. Such trading prices would be ludicrous if these purported cost figures were accurate. In short, the cellular carriers are caught between Scylla of admitting supracompetitive profits and the Charybdis of repudiating the high valuations the market and leading cellular companies are placing on their systems.

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market is $93.7 million. Multiplying $93.7 times 25 gives $2.3 billion. Kwerel & Williams, "Changing Channels: Voluntary Reallocation of UHF Television Spectrum," November 1992 at 68 (hereafter Kwerel & Williams).

2 For example, Mr. Thomas Wheeler, representing the Cellular Telecommunications Industry Association, in testimony before the Senate Subcommittee on Telecommunications on July 1, 1992 said that administrative costs should be $25 to $45 a month per subscriber and that local exchange access costs and other per minute operating costs are $.40 a minute. These monthly and per minute cost estimates exceed the $23 monthly access fee and $.39 per minute retail charges on which this report bases its revenue projections. Unless Mr. Wheeler believes cellular retail prices are substantially greater than those used in this report, his "model" would leave only roaming revenues to cover all remaining costs including the not insubstantial marketing and capital costs.

Discounted cash flow analysis and trading prices demonstrate that cellular service prices are above reasonable costs and that profit levels are supracompetitive.

a. DCF Analysis

Estimating the profitability of the cellular industry requires looking beyond current losses found in parts of the industry. These losses are misleading for two reasons. In many cases, they result from companies paying off debt for acquisitions of cellular properties that were purchased at prices that reflect the capitalized value of anticipated profits. Also, these losses ignore the future profits the investment community expects cellular companies to earn. In valuing a company, experts consider the present value of the company's cash flows over several years.[3]

Drawing on publicly available information and the analysis of securities analysts and expert government agencies, this report performs a discounted cash flow analysis of the cellular industry. Simply put, discounted cash flow analysis requires estimating future revenue and cost streams. The difference between the two streams provides an aftertax cash flow which can be discounted to the present to provide an estimated value of the company.

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[3] See generally, J. Sanders, "Valuing Cellular Systems: Techniques and Trends," Telocator, Dec. 1986, at 34 (hereafter Sanders).

In order to assure that the base case provides a conservative estimate of cellular service company profits and valuations, this report generally errs on the side of underestimating revenues and overestimating costs. For example, it uses conservative estimates of factors that affect cellular revenues such as per minute prices, subscribership levels, monthly bills, growth rates, and the growth of competition. Likewise, it uses conservative estimates of factors affecting operating and capital costs.

b. Base Case Revenues

A cellular company's revenues are a function of total subscribers times average subscriber usage times average rates. (See Table 1) The 1992 subscriber base is estimated to have been 7.6 million. On March 17, 1992 CTIA reported this subscriber base was achieved as of December, 1991. For the first three years thereafter an annual rate of growth of 25 percent is assumed. Over the next three years the growth rate is assumed to be 20 percent. Over the last three years the growth rate is assumed to be 10 percent. This growth rate is significantly under the growth rate projected by Donaldson, Lufkin & Jenrette.[4]

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[4] Leibowitz, Gross, Buck & Moran, "The Cellular Communications Industry," Donaldson, Lufkin & Jenrette, Winter 1991-1992, at 14 (hereafter DLJ).

The conservative nature of these subscribership levels is also borne out by the fact that the resulting penetration rates are below or consistent with most observers' projections.[5] Donaldson Lufkin & Jenrette forecasts cellular penetration to exceed 14 percent by the year 2000.[6] Morgan Stanley estimates the penetration rate in the year 2000 to be 12.5 percent.[7] This report uses estimates that range from under 3 percent in 1992 to 12.24 percent in 2001.

To calculate revenues per subscriber per year, the above subscriber figures are multiplied by average subscriber minutes per month times average monthly access and per minute rates by twelve months. Conservatively, this report uses Morgan Stanley's estimates of (1) 116 minutes per month per subscriber (reduced 8 percent annually)[8] and (2) $23 for monthly access and $.39 per average minute (decreased 5 percent per year from 1996 to

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5 In 1990, approximately 250 million people (pops) lived in the U.S. Starting with that figure a 1 percent annual growth rate was projected. Consequently, in 1992 there were 255 million pops. See E. Greenberg & C. Lloyd, "POP Out: The Changing Dynamics of the Cellular Telephone Industry," Morgan Stanley, April 23, 1991 at 13, 15, & Appendix N (hereafter Morgan Stanley). The penetration rate is the ratio of subscribers to pops.

6 DLJ at 13.

7 Morgan Stanley at 10.

8 Morgan Stanley at 20.

2000).[9] The resulting average monthly revenue per subscriber ranges from $68 in 1992 down to $40 in 2001. These figures appear conservative when juxtaposed with other estimates. For example, the national average monthly bill in 1988 was $95.[10] Similarly, Donaldson Lufkin & Jenrette's report assumes monthly revenue per subscriber is $105 in 1988 and gradually falls to $70 in 2000.[11] A conservative 10 percent of total revenues was included for roaming revenues.

c. Base Case Costs

Operating costs are broken into three kinds of costs: local access costs, new subscriber marketing costs, and a residual category of operating costs. (See Table 2) This report uses $.05 per minute

the top end of McCaw's range, $1000 per net new customer, in 1992 and decrease from that amount by $50 a year.[14] The remaining operating costs are estimated to be $8 per month per subscriber.[15]

These estimates are based on the Morgan Stanley report and are roughly comparable to those used by others. The Morgan Stanley analysis on which this report's cost and revenue assumptions are based generally casts a skeptical eye on cellular's current trading prices. It assumes competition is coming and that starting in the mid-90s cellular companies will be forced to cut their prices faster than generally expected. It also assumes slower growth rates. Consequently, it is relatively bearish, concluding that several cellular systems are over priced. Donaldson Lufkin and Jenrette and Kwerel and Williams are generally more bullish.[16] The Congressional Budget Office, in its report estimating the value of cellular spectrum, adopts the Morgan Stanley cost assumptions.[17]

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14 Using $300 per gross new subscriber, assuming 30 percent annual churn rate produced similar estimates of cellular

d. Base Case After Tax Cash Flow

After tax cash flow is estimated by subtracting income taxes and adding back appropriate capital expenses.[18] (See Table 4) Income taxes are calculated by applying the appropriate tax rate to operating profits less depreciation. The net income figure is supplemented by adding in depreciation (which was subtracted to calculate taxes) and subtracting capital expense (the actual capital expenses incurred in that year). The resulting after tax cash flows are added and discounted to the present using a 12 percent discount factor.

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[18] To factor in capital expenses, gross plant, capital addition, capital replacement and depreciation figures needed to be estimated. (Table 3) The base gross capital plant figure for 1992 is based on a $17 per pop per system. This figure is consistent with the analysis performed by NTIA. See NTIA, U.S. Spectrum Management Policy: Agenda for the Future, February 1991 at D-4 (hereafter NTIA). It is also consistent with the CTIA estimate of the capital base in 1992. CTIA, Press Release, March 17, 1992. The cost of new subs plus digitization and the cost of replacement capital are taken from Morgan Stanley's Appendix O. The depreciation rate was estimated to be 10 percent. Morgan Stanley at 25.

In 1992 net plant is assumed to be 80 percent of gross plant which is the same ratio used in 1992 by Morgan Stanley, Appendix O. This estimate is consistent with those of Shew and Malarkey Taylor. See W. B. Shew, "Tobin's Q for Cable Television, Media and Telecommunications: A Comparative Assessment," Putnam, Hayes & Bartlett, at 14-16.

e. Base Case Market and Per Pop Values

The fair market value for two nationwide cellular systems can then be calculated by adding that cumulative cash flow figure to a properly adjusted residual value (See Table 5). The residual value reflects the value of the cash flow stream beyond 2001. Typically residual values are estimated by multiplying the last year's operating profit by a multiple of 8.[19] This report increases that multiple to 12 to produce liberal estimates of the implied per pop values in the base case and other scenarios. The residual figure must be reduced by taxes and discounted to the future. The sum of the adjusted residual and the cumulative after tax cash flow for the years 1992 through 2001 gives the fair market value for two nationwide cellular systems. Dividing that amount by twice the number of pops gives the implied per pop value.

f. Results Under Base Case & Other Scenarios

Over a ten year period the base case analysis projects that the average annual rate of return on capital in the cellular industry will exceed 30 percent. Using a generous cost of capital of 15 percent,[20] the direct savings that would accrue to consumers over

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19 See Sanders at 39.

20 The Morgan Stanley analysis uses a 13 to 15 percent aftertax return as the return on capital needed to attract investors

Continued on following page

the ten year base case are estimated. Then the base case is varied using different estimates of prices, subscriber growth, and calling minutes per subscriber. In present value terms, the nationwide consumer savings over ten years ranged from $8 to $23 billion. (See Summary Table)

While the estimates and results are consistent with the results of analysts from Morgan Stanley and Donaldson, Lufkin & Jenrette, they were also tested by computing the implied per pop value for each estimate. The per pop valuation in the base case is roughly $90. That figure is substantially below the per pop values for publicly traded cellular stocks or relatively recent cellular stock acquisitions.

The sensitivity of these per pop values to various changes was also calculated. For example, assuming all rural pops are valued at zero, the base case per pop value increases to roughly $120. Even with this and other changes the per pop value implied in the base case remains well below typical market valuations for cellular companies.

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to a competing third cellular system, a far more risky proposition. Morgan Stanley at 6.

g. Results considering the scarcity value of the spectrum.

Next the investment capital was increased to reflect the scarcity value of the spectrum. It did not significantly change the results. NTIA's spectrum study estimates that broadcasting spectrum's market value on a per MHz basis is one-fiftieth of the market value of cellular spectrum. NTIA's findings set the average market value of 1 MHz of spectrum reserved for commercial radio and TV at $28.75 million. That equates to $1.438 billion for 50 MHz. This amount provides a generous estimate of the value of the underlying cellular spectrum if there were several cellular carriers instead of only two per relevant geographic market.[21] (By contrast, NTIA estimated the market value of 50 MHz of cellular spectrum in urban areas to be $80 billion.[22]) Including a 15 percent return on $1.438 billion to reflect the scarcity value of the spectrum reduces the base case present value estimate for ten years to $6.9 billion.

h. Consideration of possible scarcity rents.

Over the ten year period considered in this study, some cellular systems may be constrained by the capacity limitations, but this should be a rare occurrence for several reasons. First, any alleged capacity constraint is belied by cellular's consistent and

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21 It should be noted that these broadcast spectrum estimates may overstate the scarcity value of the spectrum, because the broadcasting stations occupy more valuable spectrum and may themselves possess some market power.

22 NTIA at 91-92 and D1-D6.